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ENTOMOLOGICAL NEWS

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Themira nigricornis Meigen in North America, With a Revised Key to the Nearctic Species of Themira (Diptera: Sepsidae)

By GEORGE STEYSKAL, Detroit, Michigan

Among material kindly submitted for determination by G. C. Crampton were three male specimens of a species of *Themira* different from any known to occur in North America. Consultation of the Duda monograph [1] showed that the specimens, captured in Cambridge, Mass., on April 24, May 16, and May 18 respectively, 1940, were *Themira nigricornis* Meigen, a species which belies its name in having antennae less black than its nearest relative, *T. putris*. Professor Crampton has graciously allowed the writer to retain the specimens in his collection.

In order to show the relationships of *T. nigricornis*, as well as those of two species described by Curran, the following key is offered. The genus is apparently restricted to the Holarctic region.

Key to the American Species of Themira

1. Sternopleura largely or wholly polished.....2
   Sternopleura entirely whitish pruinose.....5
2. Males; fourth sternite with lateral tufts of long hair; fore legs greatly deformed (male of *T. notmani* unknown)...3
   Females (female of *T. maculitarsis* unknown).....4

[1] Duda, O., 1926, Monographie der Sepsiden, Ann. naturhist. Mus. Wien, 39: 1–153, 1 folding chart, pls. 1–7; 40: 1–110, pls. 1–9. Malloch (1928, Proc. Linn. Soc. New South Wales, 53: 611) has shown that although the first part of the Duda work (palaearctic and nearctic regions) bears the date December, 1925, it did not appear until January 16, 1926; the second part appeared on December 10, 1926.

3. Middle tarsi yellowish; fore basitarsus as long as the two following joints together, the second joint articulating at one-fourth from the tip of the basitarsus (Hudson Bay—1917, Wash. Agric. Expt. Sta. Bull. 143: 46)
♂ *T. malformans* Melander and Spuler

Middle tarsi with each joint whitish basally, black apically; fore basitarsus slightly longer than the second joint, which articulates at the middle of the basitarsus (Birtle, Manitoba—1929, Amer. Mus. Novitates No. 339:10)
♂ *T. maculitarsis* Curran

4. Legs mostly reddish; fore femora without bristles below (Grant Mt., Essex Co., N. Y., running with ants—1927, Amer. Mus. Novitates No. 275: 2)..♀ *T. notmani* Curran

Legs black; fore femora on under side with two approximate spines.....♀ *T. malformans* Melander and Spuler

5. Small species 2–3 mm. in length; anterior notopleural bristle not half as long as posterior.....6

Larger species 4–5 mm. in length; anterior notopleural bristle over half as long as posterior.....8

6. Fore coxae yellow; male fore femora nearly straight, only slightly sinuate on upper side; female fore femora with two or three small stout bristles on middle of under side (N. Y., Conn., Pa., Ill. [types]; Mich.—1917, Wash. Agric. Expt. Sta. Bull. 143: 46)
T. flavicoxa Melander and Spuler

Fore coxae dark brown to blackish; male fore femora strongly deformed, strongly sinuate on upper side, with a long bristle at base of under side; female fore femora without bristles near middle beneath, with but one, or with four or five.....7

7. Male middle tarsi with last three joints cordate, wider than long; female fore femora on under side without or with but one small bristle near middle (Wash., Ore., Mont., Vt., Pa., [types]; N. Y. (Leonard)—1917, Wash. Agric. Expt. Sta. Bull. 143: 45, fig. 23 [on pl. opp. p. 80])
T. latitarsata Melander and Spuler

Male middle tarsi with last three joints not broadened, longer than wide; female fore femora with four or five small, closely spaced bristles near middle beneath (Islands of Washington Sound, Wash.—1917, Wash. Agric. Expt. Sta. Bull. 143: 44)...*T. incisurata* Melander and Spuler

8. Antennae wholly black; cheeks white-pruinose; mesonotum with very thin brownish pruinosity, supra-alar bristle strong; ends of third and fourth veins almost parallel; MALE: long lateral hair tufts present on fourth sternite; fore femora with backwardly bent spine in emargination;

fore tibiae with conspicuous pale lappet at middle (Europe; widespread in northern nearctic region—1761, Fauna Suecica, 2d ed.: 456; 1917, Melander and Spuler, Wash. Agric. Expt. Sta. Bull. 143: 43, f. 25 [on pl. opp. p. 80]; 1926, Duda, Ann. naturhist. Mus. Wien 39: 92, pl. 3, f. 13) ..... *T. putris* Linnaeus

Antennae reddish basally; cheeks brown, not pruinose; mesonotum with rather heavy brownish pruinosity, supra-alar bristle lacking; third and fourth veins strongly convergent; MALE: without tufts on fourth sternite; fore femora with distally inclined spine in emargination; fore tibiae without lappet (Europe; Cambridge, Mass.—1826, Syst. Beschr. 5: 291; 1926, Duda, Ann. naturhist. Mus. Wien 39: 94, pl. 3, f. 14) ..... *T. nigricornis* Meigen

Themira minor is not included in the above key; lacking humeral bristles, it belongs in the genus *Enicomira* Duda, as shown in the writer's key to the American genera of Sepsidae (Pan-Pacific Ent., 19: 93, 1943). Duda has expressed the opinion that *T. incisurata* might equal *T. pusilla* Zett. and that *T. flavicoxa* might equal the poorly known *T. gracilis* Zett.

Some Fungus-Growing Ants Eat and Harvest Wild Fungi

By George N. Wolcott, Agricultural Experiment Station, University of Puerto Rico

The unique agricultural habits of the fungus-growing, leaf-cutting, or "parasol" ants of the neotropics are supposed normally to trend toward one-crop farming. The pieces of leaves of plants which the larger workers are seen carrying on their backs "like parasols" are comminuted inside the nest into a substratum on which is grown in pure culture a specific symbiotic fungus which is the only food of the ants. Thus, to have these ants eating wild and uncultivated fungi, and cutting up the wild fungus, as they normally would the leaves of trees, and carrying bits of it into the nest seems a deliberate and wanton contamination of the pure culture, besides being a reversion from an agricultural stage of culture to one much more primitive in which natural growths are eaten immediately, and the incidental surplus brought into the nest.

Some laborers of the Instituto Agronomico do Norte, at Belém, Pará, Brasil, engaged in clearing the land for planting rubber, had discarded an unbarked but trimmed pole beside the path in the forest leading to the clearing where their huts were located. On this prostrate pole, towards the end of the rainy season, an abundant growth of "oyster" fungi had appeared, and when observed on May 24, 1945, the part of it overgrown with fungi was serving as a path on which the fungus-growing ants were carrying pieces of cut-up leaves to their nest. Some of the ants, however, had been diverted from their task, and were intently feeding on the edges of the fresh white oyster mushrooms, while minims running about below were cleaning up all the chips. When the procession arrived at the butt end of the pole, it consisted of ants carrying only bits of green leaves, but when it left the pole for the nest, every third or fourth ant carried a white burden on its back: a bit of freshly-cut fungus.

Observed early the next morning, some fungi had been eaten down to their main stems, and the ants were beginning on others that may have developed during the night. Time and tide wait for no man, or ant, especially in a Brasilian forest, and numerous ghostly white beetle larvae were also feeding on the fungi, as was discovered when the fungus-infested part of the pole was brought into the guest house of the Instituto to dry. The beetle larvae cleaned out the stems of the fungi until only a hard, dry shell remained, and then aestivated until a fresh supply of polypore fungus was supplied them in Puerto Rico. This proving acceptable, they promptly continued growth and development, eventually becoming small, shining, oval, bright yellow beetles, identified by Mr. W. S. Fisher of the U. S. National Museum as a species of *Mycotretus* (Erotylidae), a genus of which eighty species have been recorded from Brasil.

The master carpenter of the Instituto identified the wood of the pole as being "cupiuba," of which he had additional lumber in his shop. Cupiuba is *Goupia glabra* Aubl, a reasonably common tree in the Amazon and Guiana forests, favorably known because of its resistance to the attack of dry-wood termites, and extensively used in construction.

The least-eaten oyster fungus available was dried in the herbarium-oven of Dr. W. Andrew Archer, and, via diplomatic pouch, submitted by Dr. H. M. Langford to Mr. John A. Stevenson, Senior Mycologist in charge, Division of Mycology and Disease Survey, Beltsville, Maryland. Of it he writes, under date of July 11, 1945, as follows:

"The mushroom which the ants were cutting up and carrying off to their nest is a species of *Pleurotus*. The common "oyster" mushroom is a member of this genus. What the Brazilian or other tropical species of this genus are, no one knows. I looked through Moller's classical work on the fungi grown by the leaf-cutting ants of Brazil, and the species involved, in his account at least, are distinctly not of the genus *Pleurotus*. Perhaps the ants were using this form for food direct, and not mixing it into their fungus plantations."

Specimens of the ants eating and carrying to the nest the *Pleurotus* were determined by Dr. Neal A. Weber of the University of North Dakota as being *Acromyrmex* (*A.*) *coronatus* Fabricius. To be sure, this is not the most specialized form of the Myrmicine tribe Attii, but is given by Wheeler as being next to the least primitive and the nearest to *Atta* s. str. It should therefore be among the least likely to exhibit such recessive traits as eating wild fungi and harvesting them into its nest.

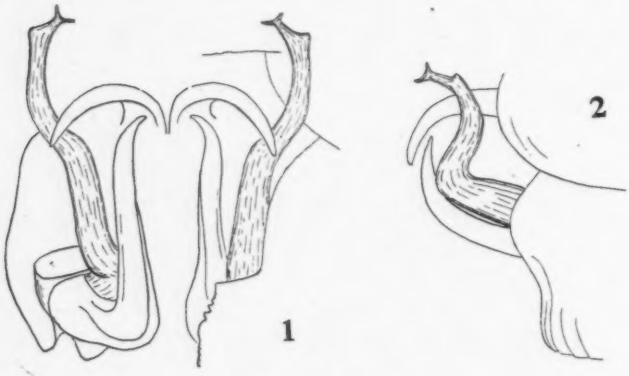
Texophon, a New Genus in the Diplopod Family Lysiopetalidae

By Ralph V. Chamberlin

In a small collection of millipeds and centipeds taken in Texas from nests of the wood rat *Neotoma micropus* Baird, by Maj. D. E. Hardy, were two males representing the interesting new species and genus here described. Taken at the same time from these nests were representatives of two other millipeds, *Aniulus prosoicus* Chamberlin and *Siphonophora texascolens* Chamberlin. The types of the new form are at present retained in the author's collection.

Genus **TEXOPHON**, new

Distinguished from *Spirostrephon* and *Delophon* in the structure of the gonopods. In these the principal blade is simple, not bent laterad into a subuncate process as exhibited by *Spirostrephon* and lacking the subapical trifurcate process in the latter; distally somewhat sigmoidally flexed and curving forward; from outer side of base of each a slender, less sclerotized, simple slender process curving about caudal side and then paralleling the gonopod proper, a pair of shorter pale processes arising cephalad of gonopods and distally curving caudo-ectad.



Texophon nessius, n. sp.

Fig. 1. Gonopods of male, ventral view, with exoskeleton removed on one side.
Fig. 2. Left gonopod in situ, ectal view.

Texophon nessius, new species

Body yellowish with a dark longitudinal dorsal band geminated by a narrow median yellow stripe. Head black between eyes and antennae, the vertex covered with a network of dark lines. Legs yellow. Antennae dusky. Antennae long, filiform; second and third articles longest, subequal, the fourth and fifth somewhat shorter, with the sixth next in length. Eye

patch large, composed of 7 or 8 vertical series of ocelli; e.g., from behind forward, 8, 8, 7, 7, 6, 5, 4.

Collum with 20 crests across caudal border low, subequal in length.

First two pairs of legs in the male with a median ventral comb of hairs. The other anterior legs with ventral surface studded with numerous short setose points arising from nodular bases. Third legs in types with fungiform or pustular extrusions from coxae.

Gonopods as shown in figs. 1 and 2.

Number of segments in male holotype, 50.

Length, about 19 mm.; diameter, about 1.2 mm.

Locality:—TEXAS: Laguna Madre, 23 miles south-east of Harlingen. Two males taken in nest of *Neotoma micropus*, September 26, 1945, by D. E. Hardy.

Obituaries

Dr. Alfredo Borelli. We learn from a recent issue of the 'Annali' of the Civic Museum of Natural History of Genoa that Dr. Borelli died May 6, 1943, at Boves, near Cuneo, Piedmont, Italy, at the age of eighty-four. In addition to his numerous and important studies of the Dermaptera, which constitute the most outstanding series of contributions on the systematics of these insects to appear in the last thirty years, Dr. Borelli also published papers on reptiles, scorpions and the Solpugida. In 1893 and 1894, Dr. Borelli visited the Chaco of Argentina, Paraguay and Bolivia and there made important insect collections.

Dr. Carlo Menozzi. From the 'Annali' of the Genoa Museum we have also learned of the death of Dr. Menozzi, on March 4, 1943, at the age of fifty-one. Dr. Menozzi was also a student of the Dermaptera, and had published other contributions on ants.

Papilio Aristodemus Ponceana Schaus (Lepidoptera: Papilionidae) Notes

By W. F. HENDERSON, Chicago, Illinois

Since the publication of the articles on this species in the February and July (1945) issues of Entomological News, further communications have been received.

Mr. Franklin H. Chermock has kindly submitted data concerning the specimens in his possession. It is interesting to note that he has two specimens which are believed to have been captured by Schaus himself.

No. 34 ♂ Miami, Florida, May 1899; collected probably by Schaus. In F. H. Chermock collection.

No. 35 ♂ Same as No. 34.

No. 36 ♀ Matecumbe Key, Florida, May 7, 1943, Mrs. C. N. Grimshawe. F. H. Chermock collection.

No. 37 ♀ Same as No. 36, except collected on May 14, 1944.

No. 38 ♀ Same as Nos. 36, 37, except collected on June 2, 1944.

Nos. 39–44 Six ♂♂, all collected at the Matecumbe Key, May 3–22, 1945 by Mrs. C. N. Grimshawe. F. H. Chermock collection.

No. 45 ♀ Key Largo, Florida, June 14, 1941; collected and owned by Mr. Carl Cook, Crail Hope, Kentucky.

No. 46 ♂ Matecumbe Key, Florida, May 2, 1945; Mrs. C. N. Grimshawe. Carl Cook collection.

Mr. Cyril F. DosPassos of Mendham, New Jersey, reports the acquisition of 28 specimens (18 ♂♂ and 10 ♀♀) from Mrs. Grimshawe. The writer has also acquired four more specimens for his own collection, all from Mrs. Grimshawe.

It is now quite apparent that ponceana is coming to be better known than it was for many years and that this beautiful species will be represented in more collections as the years pass. The pioneer collector of this species continues to be Mrs. C. N. Grimshawe, who has been responsible for 66 of the 78 specimens referred to in this series of notes.

In conclusion, the writer again wishes to express his thanks to all of those who have cooperated with him in this survey.

A Mechanical Holder for Microscopical Examination of Pinned Insects

THEODORE A. OLSON, Lt. Colonel, Sn. C.*
Eighth Service Command Laboratory, Fort Sam Houston, Texas

Taxonomic work in entomology usually involves careful examination of insects from all angles; some of the positions are frequently difficult to attain with the ordinary cork blocks or other common devices used as holders for pinned specimens. In an attempt to overcome some of the difficulties and in an effort to expedite identifications, a mechanical holder which is an integral part of the microscope stage was developed at the Seventh Service Command Medical Laboratory, Fort Omaha, Nebraska, in early 1942. This device was produced with the assistance of Ordnance machinists at that post, and the first working model was used during the 1942 season. The success of this device, as measured by its popularity with technicians who had the opportunity to use the holder, indicated that it was a practical piece of equipment which could be given further trial. To date, 5 mechanical holders have been made; each has received a favorable comment by users. The first model has been in almost daily use for 3 years.

The device can be made by a professional machinist in 2½ to 3 hours time. Brass stock is used. Dimensions and assembly are indicated in figure 2. When completed the holder is mounted on the binocular dissecting microscope stage by drilling a hole (for the threaded center pin) through the stage at a point approximately 1⅛ inches from the right side and 5¼ inches from the front edge of the platform when the microscope is in working position (figure 1). The exact position will vary somewhat with the type of microscope in use, but there is

* On military leave, School of Public Health, University of Minnesota.

considerable leeway and this fitting may be done by anyone who has a fair amount of mechanical ability. Left-handed persons may wish to mount the device on the left side of the stage. The final position should be such that the insect-carrying head may be centered under the objectives when needed, while it may readily be swung back toward the center pillar of the microscope, and out of the way, when not in use.

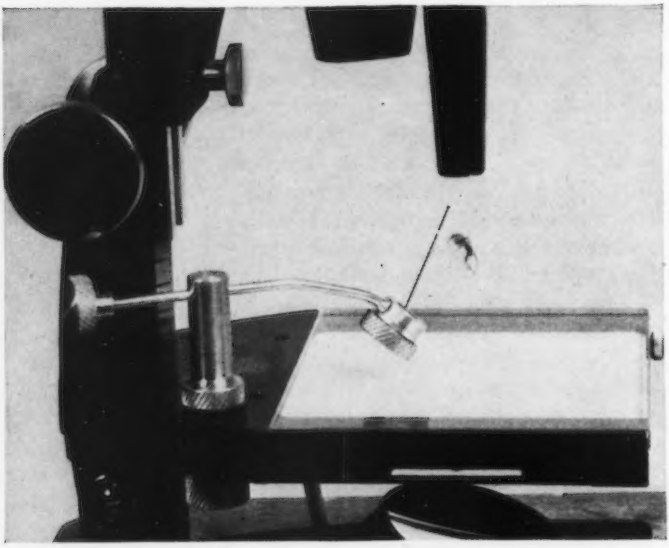


Figure 1

Some of the movements which may be accomplished by the holder are illustrated in figure 2. Briefly, there is a primary horizontal rotation about the main upright, a vertical rotation through the long horizontal rod, another rotation accomplished by the central sleeve of the head, and, finally, a long, back-and-forth, horizontal movement produced by sliding the rod through the upright. By placing a "point mounted" insect at an angle to center it over the mid-point of the head, the insect will stay in focus through practically all rotational movements. If bends

A and B have not been accurate, the centering may be imperfect, but this may easily be corrected by changing the angle of the head to a small degree. If, as is the custom with some workers, the microscope is used with the base removed, a very flat terminal nut must be substituted for the one shown. Because there is only a limited hollow space beneath the microscope platform, the tension spring and threaded center pin may also have to be reduced in length to permit proper mounting of the holder.

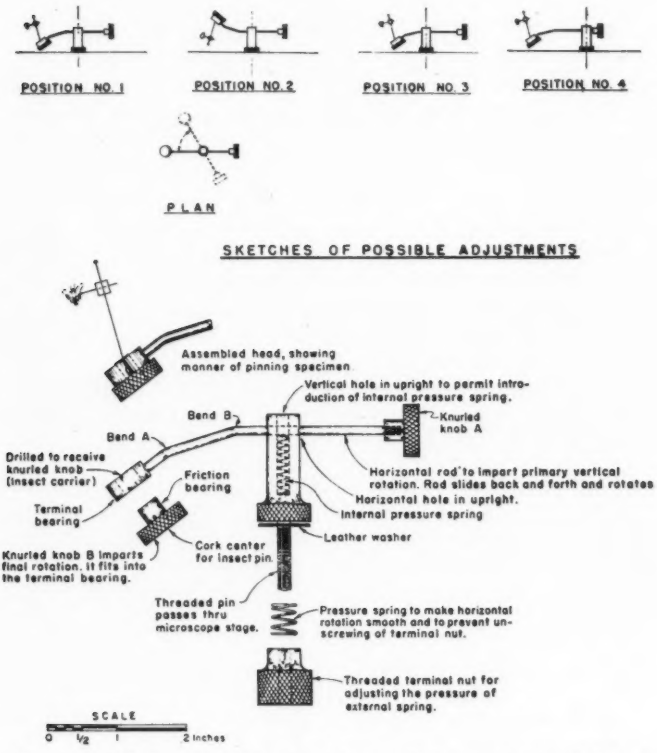

POSITION NO. 1
POSITION NO. 2
POSITION NO. 3
POSITION NO. 4
PLAN
SKETCHES OF POSSIBLE ADJUSTMENTS
Assembled head, showing manner of pinning specimen.
Vertical hole in upright to permit introduction of internal pressure spring.
Bend B
Bend A
Knurled knob A
Drilled to receive knurled knob (insect carrier)
Friction bearing
Terminal bearing
Horizontal rod to impart primary vertical rotation. Rod slides back and forth and rotates
Horizontal hole in upright.
Internal pressure spring
Leather washer
Knurled knob B imparts final rotation. It fits into the terminal bearing.
Cork center for insect pin.
Threaded pin passes thru microscope stage.
Pressure spring to make horizontal rotation smooth and to prevent unscrewing of terminal nut.
Threaded terminal nut for adjusting the pressure of external spring.
SCALE
0 1/2 1 2 inches

Figure 2. Mechanical holder for microscopical examination of insects.

Dragonflies (Odonata) Collected in Pennsylvania and New Jersey in 1945

By GEORGE H. BEATTY, III, Merion, Pennsylvania

(*Continued from page 81*)

Tramea carolina Linne.

PENNSYLVANIA: Holmes, Tinicum Marshes, and seen at Broomall, Central Square, State College and Crum Creek Farm, 22 May–8 Oct.

NEW JERSEY: Upton Ponds, 1 ♂, 20 May; 2 ♂, 29 June; 1 ♂, 12 Aug.; Cape May Point, 1 ♂, 1 ♀, 22 Sept.; seen at Upton Ponds, 24 June, 8, 22 July; Whitesbog, 24, 29 June; Cape May City, 22 Sept.

Tenerals were taken on 21 September and 8 October.

Tramea lacerata Hagen.

NEW JERSEY: Cape May Point, 4 ♂, 22 Sept.; seen at Whitesbog, 24 June.

This was the dominant dragonfly in the migrating hordes at Cape May which also included *A. junius, E. heros, L. pulchella, P. flavescens,* and *T. carolina.* No matter where one was, an upward look would reveal several *lacerata* and often other species too. At the beach, they could be seen flying out over the bay in a general southerly direction. Most of these dragonflies were teneral or young, suggesting that the urge to migrate seizes them immediately upon emergence.

Agrion apicale Burmeister.

NEW JERSEY: Upton, 1 ♂, 22 July; Fisher's Dam, 2 ♂, 28 Aug.; Friendship Creek, 2 ♂, 1 ♀, 4 Sept.; Albertson Brook, 1 ♂, 5 Sept.; Clark's Brook, 4 ♂, 2 ♀, 7 Sept.

Only a few *apicale* were seen beside those captured.

Agrion maculatum Beauvois.

PENNSYLVANIA: Broomall, Slab Cabin Run, Spring Creek, Echo Valley Farm, Darby Creek, Westtown Lake, and seen at Bear Meadows and Crum Creek Farm, 16 June–3 September.

NEW JERSEY: Upton, Whitesbog, 5 May–12 August.

This species is largely replaced by *A. apicale* on the New Jersey cedar streams.

Hetaerina americana Fabricius.

PENNSYLVANIA: Darby Creek, 3 ♂, 2 ♀, 27 Aug.; 4 ♂, 7 ♀, 29 Aug.; Westtown Lake, 28 ♂, 28 ♀, 3 Sept.
NEW JERSEY: Albertson Brook, 8 ♂, 6 ♀, 5 Sept.; seen, Cecil, 5 Sept.

Lestes eurinus Say.

PENNSYLVANIA: State College, 1 ♂, 17 June.

Lestes congener Hagen.

NEW JERSEY: Pond near Fisher's Dam, 8 ♂, 5 ♀, 31 Aug.; 26 ♂, 21 ♀, 4 Sept.; 1 ♀, 7 Sept.

Congener was found in moderate numbers when this locality was visited, for the first time, on 31 August at 3:30 P.M. The pond was revisited at 11:00 A.M. on 4 September and not a single *congener* was seen, but at 3:00 P.M. on the same day this species was found in prodigious swarms, hundreds of coupled pairs being seen ovipositing on dried-up stems of Juncus sp. one to two feet above the water. At 5:00 P.M. on 7 September only two or three *congener* were found. On all four visits the temperature, humidity, etc., were about the same. The diurnal distribution of *congener* is evidently quite restricted at this locality at least. This is the first capture of this species in New Jersey.

Lestes unguiculatus Hagen.

PENNSYLVANIA: State College, 2 ♂, 4 ♀, 17, 19 June; Penn Valley, 9 ♂, 30 Aug.; 2 ♂, 2 Sept.; Holmes, 1 ♂, 21 Sept.
NEW JERSEY: Whitesbog, 1 ♂, 24 June.

Lestes forcipatus Rambur.

PENNSYLVANIA: Penn Valley, Broomall, State College, Holmes, 8 June–13 September.
NEW JERSEY: Pond near Fisher's Dam, Atsion Lake, Folsom, Erma, 31 August–22 September.

Lestes rectangularis Say.

PENNSYLVANIA: Central Square, State College, Echo Valley Farm, Holmes, 16 June–5 October.

Lestes dryas Kirby.[12]

PENNSYLVANIA: State College, 1 ♂, 4 ♀, 17 June.

[12] Formerly known as *L. uncatus* Kirby. See Cowley, Generic names of British Odonata (1935).

Lestes vigilax Hagen.

NEW JERSEY: Upton Ponds, 3 ♂, 1 ♀, 24 June; 6 ♂, 1 ♀, 29 June; 7 ♂, 30 June; 4 ♂, 2 ♀, 8 July; 1 ♀, 22 July; 5 ♂, 3 ♀, 12 August; Whitesbog, 3 ♀, 24 June; 1 ♂, 29 June; Fisher's Dam, 7 ♂, 3 ♀, 21 Aug.; 4 ♂, 1 ♀, 28 Aug.; 3 ♀, 31 Aug.; 2 ♂, 1 ♀, 4 Sept.; Pond near Fisher's Dam, 3 ♂, 1 ♀, 4 Sept.; Batsto Pond, 6 ♂, 1 ♀, 5 Sept.

Though this is the most abundant *Lestes* in southern New Jersey, none was taken in Pennsylvania in 1945.

Argia apicalis Say.

PENNSYLVANIA: Westtown Lake, 5 ♂, 2 ♀, 3 September.

Argia bipunctulata Hagen.

NEW JERSEY: Whitesbog, 1 ♂, 24 June (J. Gillespie).

Argia tibialis Rambur.

NEW JERSEY: Fisher's Dam, 1 ♂, 31 Aug.; Clark's Brook, 1 ♂, 7 Sept.

In both cases, *tibialis* was taken on a small cedar stream flying with *A. violacea* and *Enallagma weewa*.

Argia violacea Hagen.

PENNSYLVANIA: Broomall, Crum Creek Farm, Darby Creek, Westtown Lake, 3 August–3 September.

NEW JERSEY: Upton Ponds, Whitesbog, Fisher's Dam, Branch of Friendship Creek, Friendship Creek, Albertson Brook, Batsto Pond, Clark's Brook, Sleeper Brook; seen at Atsion Lake, 24 June–7 September.

At Fisher's Dam this species occurred in countless numbers and it was common along all of the cedar streams visited. Its abundance at the Pennsylvania points noted was neglegible by comparison with the swarms found in New Jersey.

Amphiagrion saucium Burmeister.

PENNSYLVANIA: Bear Meadows, 4 ♂, 5 ♀, 16 June; State College, 33 ♂, 27 ♀, 19 June.

This species was not seen at all in eastern Pennsylvania or New Jersey.

Nehalennia gracilis Morse.

PENNSYLVANIA: Bear Meadows, 9 ♂, 20 ♀, 16 June.

NEW JERSEY: Whitesbog, 6 ♂, 3 ♀, 24 June; 2 ♂, 8 July; 2 ♂, 22 July; seen, Whitesbog, 29 June.

At Bear Meadows, *gracilis* occurred in swarms in the late afternoon, and a few sweeps with the net through the grass and sedges secured five to ten specimens.

Nehalennia integricollis Calvert.

NEW JERSEY: Upton Ponds, 1 ♂, 12 August. Cecil, 1 ♀, 5 September (J. Gillespie).

In both instances, this species was secured at the weedy edge of a pond rather than the bog areas which the genus *Nehalennia* is supposed to favor.

Nehalennia irene Hagen.

PENNSYLVANIA: Bear Meadows, 1 ♂, 3 ♀, 16 June; State College, 1 ♂, 3 ♀, 17, 19 June. Holmes, 1 ♂, 1 ♀, 6 Sept. (J. Gillespie).

Chromagrion conditum Hagen.

PENNSYLVANIA: Bear Meadows, 18 ♂, 2 ♀, 16 June; State College, 2 ♂, 17, 19 June.

Enallagma divagans Selys.

NEW JERSEY: Upton Ponds, 1 ♂, 24 June.

Enallagma hageni Walsh.

PENNSYLVANIA: Bear Meadows, 3 ♂, 2 ♀, 16 June; State College, 5 ♂, 17 June; 7 ♂, 19 June.

Like *Chromagrion conditum*, coupled pairs of this species did not appear on the stream at Bear Meadows until afternoon. Tenerals were seen early in the morning.

Enallagma cyathigerum Charpentier.

PENNSYLVANIA: State College, 1 ♂, 19 June.

Enallagma geminatum Kellicott.

NEW JERSEY: Fisher's Dam, 16 ♂, 6 ♀, 21 Aug.; 31 ♂, 2 ♀, 28 Aug.; 22 ♂, 1 ♀, 31 Aug.; 22 ♂, 4 Sept.; Pond near Fisher's Dam, 4 ♂, 31 Aug.; Batsto Pond, 1 ♂, 1 ♀, 7 Sept.; seen at Batsto Pond, 5 Sept.

Everywhere at Fisher's Dam, *geminatum* occurred in swarms, flying so close to the water that it appeared to be skating on the surface.

Enallagma recurvatum Davis.

NEW JERSEY: Upton Ponds, 1 ♂, 24 June (J. Gillespie).

Enallagma signatum Hagen.

PENNSYLVANIA: Central Square, 3 ♂, 2 ♀, 22 May; 2 ♂, 1 ♀, 29 May; 4 ♂, 9 ♀, 6 June; 2 ♂, 4 ♀, 8 Aug.; Westtown Lake, 4 ♂, 5 ♀, 3 Sept.

NEW JERSEY: Fisher's Dam, 1 ♂, 4 Sept. (J. Gillespie); Cecil, 3 ♂, 1 ♀, 5 Sept.

Enallagma vesperum Calvert.

NEW JERSEY: Cecil, 13 ♂, 1 ♀, 5 September.

Only on 5 September was any New Jersey pond visited late enough in the day for this crepuscular species to be on the wing.

Enallagma pictum Morse.

NEW JERSEY: Upton Ponds, 4 ♂, 11 ♀, 24 June; 4 ♂, 8 ♀, 29 June; 5 ♂, 6 ♀, 30 June; 2 ♂, 1 ♀, 8 July; 1 ♂, 12 Aug.; Upton Ponds, seen, 22 July; Whitesbog, 2 ♂, 2 ♀, 24 June; 1 ♀, 29 June; Whitesbog, seen, 8 July, 12 Aug.; Fisher's Dam, 4 ♂, 2 ♀, 21 Aug.; 5 ♂, 6 ♀, 28 Aug.; 1 ♀, 4 Sept.; Fisher's Dam, seen, 31 Aug.; Cecil, 4 ♂, 2 ♀, 5 September.

Enallagma exsulans Hagen.

PENNSYLVANIA: Westtown Lake, 2 ♂, 2 ♀, 3 September.

Enallagma weewa Byers.

NEW JERSEY: Fisher's Dam, 7 ♂, 2 ♀, 31 Aug.; 4 ♂, 4 Sept.; Branch of Friendship Creek, 15 ♂, 31 Aug.; 27 ♂, 1 ♀, 4 Sept.; 7 ♂, 7 Sept.; Friendship Creek, 4 ♂, 4 Sept.; 6 ♂, 7 Sept.; Albertson Brook, 1 ♂, 5 Sept.; Clark's Brook, 20 ♂, 12 ♀, 7 Sept.; Sleeper Brook, 5 ♂, 3 ♀, 7 Sept.

This was decidedly the most abundant dragonfly along the New Jersey cedar streams in early September. Only *Argia violacea* approached it in numbers. All of the females were taken in cop. with males, no single females having been seen. Ovipositing pairs were extremely abundant on Clark's Brook where they were seen on the stems of Sparganium and Scirpus and on the leaves of Vallisneria and other plants floating on the surface of the water. Both sexes curved their abdomens in semicircular arcs and the female generally inserted the eggs just below the water's surface. There are three other recorded occurrences of this species in New Jersey [13] but its almost universal

[13] See Montgomery [Ent. News, XLIV: 40–44, 1933] and Gillespie [Ent. News, LII: 225–226, 1941].

distribution in the pine barrens has hitherto been unsuspected. Comparison with the available records from Florida, Georgia, South Carolina, and North Carolina [14] suggests that New Jersey may be the metropolis of *Enallagma weewa,* or that this species has been largely overlooked in the south.

Enallagma carunculatum Morse.

PENNSYLVANIA: State College, 1 ♂, 10 June (J. Gillespie).

Enallagma doubledayi Selys.

NEW JERSEY: Upton Ponds, 1 ♂, 24 June; 2 ♂, 29 June; 5 ♂, 1 ♀, 8 July; 1 ♂, 12 Aug.; Pond near Fisher's Dam, 1 ♂, 31 Aug.

This species was associated with *E. civile, E. aspersum,* and *Lestes vigilax* at the Upton Ponds. Females can be separated from those of *civile* only with great difficulty.

Enallagma civile Hagen.

PENNSYLVANIA: Central Square, State College, Crum Creek Farm, Holmes, 22 May–21 September.

NEW JERSEY: Upton Ponds, Cape May City, Lily Lake, Davis Lake, 24 June–22 September.

Enallagma aspersum Hagen.

PENNSYLVANIA: State College, 7 ♂, 1 ♀, 17, 19 June; Central Square, 1 ♂, 8 Aug.; Crum Creek Farm, 2 ♂, 8 Aug.; Holmes, 3 ♂, 13 Sept.; 3 ♂, 21 Sept.; 1 ♂, 5 Oct.

NEW JERSEY: Upton Ponds, 2 ♂, 29, 30 June; 7 ♂, 8 July; 11 ♂, 12 August; Pond near Fisher's Dam, 27 ♂, 3 ♀, 31 Aug.; 8 ♂, 2 ♀, 4 Sept.; Batsto Pond, 1 ♂, 5 Sept.; Batsto Pond, 7 Sept.

Enallagma traviatum Selys.

NEW JERSEY: Upton Ponds, 1 ♂, 24 June (J. Gillespie); 1 ♂, 29 June.

Ischnura ramburi Selys.

NEW JERSEY: Cecil, 4 ♂, 6 ♀, 5 Sept.; Lily Lake, 45 ♂, 18 ♀, 22 Sept.; Davis Lake, 15 ♂, 11 ♀, 22 Sept.

Heterochromatic females of this species outnumbered the homoeochromatic females in a proportion of about five to one.

[14] See Byers [Ann. Ent. Soc. Amer., XX: 385–392, 1927], Davis and Fluno [Ent. News, XLIX: 44–47, 1938], Westfall [Ent. News, LII: 15–18, 31–34, 1941], and Brimley, "The Insects of North Carolina" (1938).

Ischnura posita Hagen.

PENNSYLVANIA: Central Square, Penn Valley, State College, Crum Creek Farm, Holmes, etc., 6 June–21 September.

NEW JERSEY: Upton Ponds, Whitesbog, Fisher's Dam, Pond near Fisher's Dam, Branch of Friendship Creek, Albertson Brook, Batsto Pond, Folsom, Sleeper Brook, 20 May–7 September.

This species was found at the ponds and cedar streams nearly everywhere, but never in large numbers.

Ischnura verticalis Say.

PENNSYLVANIA: Central Square, Penn Valley, Bear Meadows, State College, Westtown Lake, Holmes, and seen at Spring Creek, Echo Valley Farm, Crum Creek Farm, 22 April–5 October.

NEW JERSEY: Whitesbog, Upton Ponds, Fisher's Dam, Pond near Fisher's Dam, Folsom, 20 May–5 September.

Anomalagrion hastatum Say.

PENNSYLVANIA: State College, 3 ♂, 17, 19 June; Central Square, 1 ♂, 8 August; Crum Creek Farm, 5 ♂, 4 ♀, 8 Aug.; Penn Valley, 1 ♂, 2 ♀, 30 Aug.; 1 ♂, 2 ♀, 2 Sept.; Holmes (seen), 13, 21 Sept., 5 Oct.

NEW JERSEY: Upton Ponds, 6 ♂, 7 ♀, 24 June; 3 ♂, 5 ♀, 29, 30 June; 3 ♂, 7 ♀, 8 July; 2 ♂, 1 ♀, 22 July; 14 ♂, 5 ♀, 12 Aug.; Whitesbog, 2 ♂, 24 June; 2 ♀, 29 June; Fisher's Dam, 5 ♂, 1 ♀, 28 Aug.; 1 ♀, 4 Sept.; Pond near Fisher's Dam, 1 ♀, 31 Aug.; 1 ♀, 4 Sept.; Atsion Lake, 22 ♂, 16 ♀, 5 Sept.; Folsom, 12 ♂, 14 ♀, 5 Sept.; Pond near Fisher's Dam, seen, 7 Sept.; Erma, seen, 22 Sept.; Lily Lake, 1 ♀, 22 Sept.

A. hastatum occurred in swarms at Holmes, Atsion Lake and Folsom, but only in relatively small numbers in the other localities.

The foregoing list represents about 70% of the combined odonate faunas of Pennsylvania and New Jersey as they are now known.[15] However, there is good cause to believe that a considerable number of additional species will be found in both states.

[15] The writer is compiling complete bibliographical catalogues of the dragonflies of Pennsylvania and New Jersey which will appear shortly. They will bring together all published records and many hitherto unpublished as well as data on distribution, seasonal range, and habitat.

Two genera are conspicuous in the 1945 collections by their poor representation. These are *Gomphus* and *Argia,* both chiefly restricted to fluviatile habitats. A glance at the list of collecting stations reveals few such habitats beside the cedar-stained streams of the New Jersey pine barrens which have a dragonfly fauna which is in many ways peculiar to them alone. Their sand bottoms and lack of turbulence, as well as the chemical nature of the water, make them a highly specialized environment.

The good representation of such genera as *Aeschna, Libellula, Lestes,* and *Enallagma,* is due to the writer's concentration upon lenitic habitats. In the preceding list, most of the dragonflies of unusual interest are lenitic forms.

Collecting was generally done on a survey basis, attempt being made to secure specimens of all forms occurring at a given place and time because of the writer's interest in dragonfly populations as such. Only in the case of species of unusual interest, such as *Aeschna constricta, Somatochlora filosa, Sympetrum obtrusum,* and *Enallagma weewa,* was rather intensive collecting of a single species resorted to.

The writer is indebted beyond hope of repayment to Dr. Philip P. Calvert who read the ms. of this article, making many valuable suggestions, and for his help, authoritative information, encouragment, and inspiration, freely given. To other odonatists who, in correspondence, aided materially in this work he is likewise grateful. Thanks are due to John Gillespie, without whose cheerful assistance many species would not have been collected, who was the author's companion on many field trips, and who willingly granted permission for the inclusion in this paper of any of his records desired. To all who assisted with field work the writer expresses his deep appreciation, especially to Alonzo Ellis, George Babb, Helen Gould, Dr. F. H. Forster, Virginia Orr, and my father, George H. Beatty, Jr. Alonzo Ellis deserves special credit, for he collected with rare discrimination and, with characteristic generosity, presented to the writer all of the dragonflies which he secured.

Personal

Dr. Henry K. Townes, Jr., was honored by the Washington Academy of Sciences on the 21st of March, 1946. The citation read: Henry K. Townes, Jr., Bureau of Entomology and Plant Quarantine, Beltsville, Maryland, in recognition of his distinguished service in the morphology and taxonomy of the insect superfamily Ichneumonoidea.

Dr. Townes' "A catalogue and reclassification of the Nearctic Ichneumonidae" was published last year as No. 11 of the Memoirs of the American Entomological Society, at Philadelphia. Much of the work on this memoir was done by Dr. Townes during his stay, as a National Research Fellow, at the Academy of Natural Sciences in Philadelphia.

Current Entomological Literature

COMPILED BY CHARLES HODGE IV, EDWIN T. MOUL, MAURICE E. PHILLIPS AND HENRY K. TOWNES JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of Journals given at the end of the literature. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Cockerell, T. D. A.—Looking Forward. [55] 22: 40. **du Dresnay, G.**—Procedure for keeping butterfly wings horizontal. [33] 9: 307–310. **Delamare-Deboutteville, Cl.**—Collection and preservation of minute insects. [12] 2: 66–69. **Faure, G. O.**—Identificaciones y datos adicionales de algunos insectos y aracnidos de Chile. [32] 48: 66–76, 1945. **Freeman, J. A.**—Studies in the distribution of insects by aerial currents. The insect population of the air from ground level to 300 feet. [15] 14: 128–154, 1945. **Frost, S. W.**—Additional Notes on Baptisia

Insects. [17] 54: 16. **Keen, F. P.**—Entomology in Western Pine Silviculture. [26] 22: 1–8. **Lhomme, L.**—A light trap which kills automatically. [33] 10: 121–122. **Miller, D.**—Apropos C. V. Riley. [26] 22: 28–30. **Monro, H. A. U.**—Low temperature fumigation. [9] 77: 192–196. **Strickland, E. H.**—Adult Odonata as Class-Room Material. [5] 39: 28–32. **Williams, C. B.**—Climate and insect life. [22] 156: 214–215, 1946. **Wright, M.**—Economic importance of dragonflies. [19] 21: 60–70.

ANATOMY, PHYSIOLOGY, MEDICAL—Beirne, B. P.—Notes on Biology of Some Hymenopterous Parasites of the Beech Weevil (Rhynchaenus fagil.). [30] 21: 7–11, ill. **Bodenstein, D.**—Corpora Allata of Mosquitoes. [4] 488: 396–405, ill. **Bourgogne, J.**—Genetics of Lepidoptera. [33] 10: 34–47, 49–63. **Cottier, W.**—Effects of rotenone bearing dusts on the diamond backed moth (Plutella maculipenis Curt.). [23] 27: 244–249, 1945. **d'Aguilar, J.**—Bionomics of Chloropidae (Dipt.). [12] 2: 3–6. **Deonier, C. C.**—Population Studies on Cochliomyia americana in Arizona. [16] 19: 26–29. **Ferreira Lima, A. D.**—Schistocerca paranensis (Brum.) in Rio Grande do Sul. [7] 1: 139–145. **Filho, J. O.**—Sobre a morfologia do penis em Lepidoptera. [8] 50: 1–79, ill., 1946. **Groth, K.**—Genetic studies on Lepidoptera. [33] 9: 323–334. **Jahn, T. L.**—The electroretinogram as a measure of wavelength sensitivity to light. [17] 54: 1–8. **Kalmus & Mitchison.**—Transplantation of larval ovaries in Drosophila from and to individuals susceptible to carbon dioxide. [22] 156: 230–231, 1946. **Leclerca, J.**—Effect of Atmospheric Humidity on eggs of a Phasmid, Carausius morosus. [30] 21: 3–5. **Le Marchand, S.**—Biology of Stigmella sericopeza Z. [33] 9: 351–357. **Le Marchand, S.**—Sexual organs of the families of Lepidoptera. [33] 10: 22–33. **Lindquist, A. W., Madden, A. H. and Schroeder, H. O.**—Effect of Temp., on Knock-down and Kill of Mosquitoes and Bedbugs Exposed to DDT. [16] 19: 13–15. **Melvin, R.**—A note on culturing of chiggers (Trombiculidae). [5] 39: 143–144. **Michener, C. D.**—Observ. on habits and life history of chigger mite, E. batatas. [5] 39: 101–118. **Muhsam, B. F. & H. V.**—Life tables for Musca vicina and Calliphora erythrocephala. [31] 115: 296–305. **Needham, A. E.**—Relative proportions in serially repeated structures. [31] 115: 335–370. **Owsley, W. B.**—Comparative morphology of internal structures of Asilidae

(Dipt.). [5] 39: 33–68. **Payne, N. M.**—Life history and habits of the flat grain beetle (L. minutus Oliv.). [17] 54: 9–12. **Perry, W. J.**—Keys to Larval and Adult Mosquitoes of Espiritu Santo (New Hebrides) w/notes on Bionomics. [26] 22: 9–18. **Roeder & Weiant.**—Site of action of DDT in the cockroach. [34] 103: 304–306, 1946. **Snodgrass, R. E.**—The Skeletal Anatomy of Fleas (Siphonaptera). [35] 104 No. 18: 1–89, ill. **Soares, O. M.**—Scolytus sp. harmful to fruit trees. [7] 1: 137–138 (S). **Strickland, E. H.**—(See General). **Suomalainen, E.**—Beitrage zur zytologie der parthenogenetischen insekten. I. Coleoptera. [3] 54: 7: 1–144, ill., 1940. **Weiss, H. B.**—Insects and the spectrum. [17] 54: 17–30. **Yeager & Munson.**—Analysis of concentration-survival time curves of arsenite-injected roaches having different resistance. [5] 39: 141–151.

ARACHNIDA AND MYRIOPODA—Bristowe, W. S.—Some notes about the American Black Widow Spider, Latrodectes mactans F. [13] 82: 54, ill. **Bristowe, W. S.**—Spider miscellany. [18] Ser. 42: 63–67, ill., 1945. **Chamberlin, R. V.**—A New Texas Lithobius. [26] 22: 20–21 (k). **Chamberlin, R. V.**—On some centipedes from Georgia. [9] 77: 215–216 (k*). **Ewing, H. E.**—Taxonomic notes on American chiggers (Larvae of the mite family Trombiculidae) including the redescription of a genus and the description of two new species. [27] 59: 21–28. **Gertsch, W. J.**—Five new spiders of the genus Neoantistea. [17] 54: 31–37. **Keegan, H. L.**—Six new mites of superfamily Parasitoidea. [36] 65: 69–77, ill., 1946. **Mello-Leitao, C de.**—Escorpioes Sud-Americanos. [6] 40: 9–468, ill., 1945. **Melvin, R.**—See Anat., etc.) **Michener, C. D.**—See Anat., etc.) **Needham, A. E.**—See Anat., etc.) **Sloggett, B. M.**—Introduction of Latrodectus to the Pacific Islands. [41] 62: 165, 1946. **Turk & Phillips.**—Monograph of the slug mite—Riccardoella limacum (Schrank). [31] 115: 448–472.

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HEMIPTERA—Beamer, R. H.—Genus Stenocranus in America No. of Mexico (Homo.-Fulgoridae). [16] 19: 1–11, ill. (*k). **Beamer, R. H.**—Erythroneura of the Vulnerata Group (Homo.-Cicadellidae). [16] 19: 15–22, ill (*k). **Cunha Marques, A. X. de.**—Cariologia comparada de alguns Hemipteros Heteropteros (Pentatomideos e Coreideos). [21] 163: 1–105, ill., 1945. **DeLong, D. M.**—New genera and spp. of Mexican leafhoppers. [5] 39: 82–83. **DeLong, D. M.**—The Mexican species of Idiodoms (Homoptera: Cicadellidae). [25] 46: 13–30, ill. (k*), 1946. **Drake & Hambleton.**—New species and new genera of American Tingidae (Hemiptera). [27] 59: 9–16, 1946. **Froeschner, R. C.**—Cercopidae or Spittlebugs of Missouri. [16] 19: 30–35, ill. (k). **Knull, D. J.**—Erythroneura of the obliqua group from Ohio and Tennessee (Homoptera: Cicadellidae). [25] 46: 45–49, ill. (*). **Sampson, W.**—Generic classification of California Aphids by first instar nymphs. [39] 7: 367–402 (k). **Usinger, R. L.**—Notes on Cuban Triatominae (Hemi, Reduviidae). [26] 22: 19–20. **White, W. S.**—The environmental conditions affecting the genetic mechanism of wing production in the Chrysanthemum aphid. [2] 80: 245–270, 1946.

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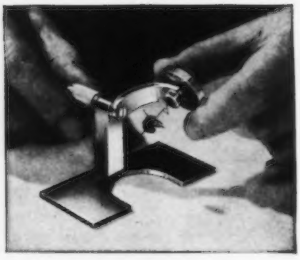

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